



# The Internet and World Wide Web

Chances are, you may very well be reading this document by way of the World Wide Web. The information has reached your desktop by traveling over the Internet, which provides the underlying network connecting your computer to millions of other computers around the world. If you want to gain a basic understanding of how the Internet and World Wide Web make this reading experience possible, then read on....

## What is the Internet?

The Internet actually consists of many, many networks interconnected very loosely. By that we mean it is a collection of separate computer networks with no single place where all the connections are registered. Whereas most computer networks are very restrictive, requiring passwords and permissions to access their services, the Internet is very open. And it is growing exponentially every year. A company called Network Wizards ([www.nw.com/zone](http://www.nw.com/zone)) provides Internet statistics showing the Internet grew from 1.3 million hosts in January 1993 to over 19 million hosts in July of 1997!

## Where Did the Internet Come from?

Like many useful items, the Internet got its start in the United States military as ARPANET, with the purpose of linking together the United States Department of Defense (DOD) and military research contractors, including many universities doing military-funded research. The ARPANET pioneered the use of dynamic rerouting, wherein if one of the network links became disrupted (by enemy attack or an errant backhoe cutting a cable) the traffic on it could automatically be rerouted to other links. The ARPANET was very successful, and it grew quickly in the academic community.

Without getting too mired in historic details, the ARPANET died out after the National Science Foundation (NSF) built a new network called the NSFNET to connect five supercomputer centers for research use. It also set up regional networks to connect the users in various regions to the NSFNET. This set of networks became very popular, but because the NSFNET only permitted traffic related to research and education, a number of independent, commercial Internet Provider network services were established to handle other kinds of traffic, all connecting to the NSFNET regional networks. Internationally, Internet Provider networks have been established in many countries. These networks are typically either sponsored by local telephone companies or run by independent national or regional providers. Most of these have connections to U.S. networks, thus connecting the globe.

## How Does the Internet Work?

The Internet is fundamentally a mechanism for sending and receiving information anywhere in the world. It does this by using a communications protocol called TCP/IP. The IP part (Internet Protocol) breaks down information into packets and routes them to their destination, often through a series of intermediate hosts. But IP by itself is not terribly reliable - if a problem occurs or the data is corrupted, IP will simply discard it. That is where TCP (transport control protocol) comes in. TCP provides what looks like a dedicated connection from one computer to another, referred to as a virtual circuit. TCP makes the transmission of information packets reliable by numbering the packets and tracking them to ensure they all arrive intact.

## Intranet vs. Internet

A fairly new term relating to the Internet is Intranet, which means an Internet system confined within a company or organization. Most companies that have a concern about confidentiality will place a firewall between the company network/intranet and the external network. Special programming on the firewall limits the kind of connections that can be made between the inside and outside, and by whom. Typically, users “inside” the firewall can access all the company’s internal (intranet) web sites, in addition to external Internet sites using the same browser, often without even being aware of which sites are internal or external. But users on the outside require special passwords to get inside the firewall.

## What Can You Do with the Internet?

People use the Internet to gain access to a huge array of information and services. These services (many of them free) fall largely into the following categories:

- **Email** has revolutionized the way many people communicate today. Once you pay for your monthly Internet fee, the Internet allows you to send and receive an unlimited number of email messages with no regard to distance. These messages can include files as “attachments,” which facilitates the virtual workplace in which people reside in different geographic locations and email their work back and forth.
- **FTP** (file transfer protocol) allows you to fetch files from other machines anywhere on the Internet. The provider of a set of files generally places them in a special area guarded by a password. Then anyone who knows the password can use FTP to retrieve the files. There is also an option to share files without a password, but the password protection is up to the owner of the files. FTP accounts for a large amount of Internet traffic, even with the growth of email.
- **Usenet news** is a service that allows people to read and post comments to a large variety of topics called newsgroups. Newsgroups are structured so that people can subscribe to topics of interests, read previous comments, then post their own comments or start new “threads” of discussion. A newsgroup can be a useful way to find information by posting a question, then monitoring the newsgroup for responses from other subscribers.
- The **World Wide Web** is a subset of the Internet, and it is large and important enough to deserve its own section, so read on...

## What is the World Wide Web?

There are many variations on this name (WWW, the Web, the Information Superhighway). This document will use the term “Web” from this point on. The Web is the part of the Internet that provides a way to get to all the information and services available on the Internet. Think of the Web as a very flexible cable TV service that adds new channels everyday. This cable TV and all its programs are “viewable” through special software on your desktop called a “web browser.”

A web browser is a program that reads web-based information which comes in a standardized format called HTML, or Hypertext Markup Language. Hypertext means that the text contains “hot” links which, when clicked, take you directly to another body of information. Markup language means documents are prepared in a generic way that will allow them to be displayed on any user’s video display. HTML documents are generally referred to as “web pages.” If you want to see what HTML format looks like, your browser may have an option to View Source - try it out!

Web browsers have played a large part in increasing the popularity of the Internet by pushing its boundaries to include graphics, sound and other multimedia content, and by making it much easier to use. Currently, the two most popular browsers are Netscape\* Navigator and Microsoft\* Internet Explorer.

## What is a URL?

At the top of your browser window you will see a line starting with `http://`. That is the URL, or Uniform Resource Locator, for the page you are on. The URL is the address your browser uses to find information located on another computer and to retrieve the server’s corresponding HTML pages. Here is a sample URL:

`http://www.intel.com/home`

A URL always starts with “http,” which stands for HyperText Transport Protocol. HTTP works much like FTP in that its basic purpose is to move files from a host machine to your machine, but it does so in a more user-friendly fashion than FTP. Next, you will often see the letters “www,” which stand for World Wide Web and indicate that you are connecting to a server that sends out HTML files. After that you will see the name of the server on which these files reside. The rest of the URL is the directory path on the server where the pages are found. Typically, all the web pages associated with a web site are branches off of a main page or “home page.”

## What Is the Real Significance of the Web?

Some people have been profoundly impacted by the growth of the Web, while others barely notice it except for headlines or snippets of overheard conversations. Here are a few examples of how the Web has changed many people’s job functions:

- Instead of checking her mailbox and fax machine daily for incoming correspondence, the administrative assistant checks her email inbox, and spends anywhere from 10 minutes to two hours on email correspondence. She spends very little time placing paper documents or letters in envelopes with stamps.

- When researching market statistics, the analyst stays at his desk rather than going to a physically distinct place called a library. The analyst performs web searches using keywords, or checking his frequently used (bookmarked) web sites for information relevant to his research. An incredible array of information is available to him, much of it free.
- The service consultant needs troubleshooting tips to repair a product at her customer site. Before leaving home she signs in to her company intranet, enters the URL for the service database, enters a few keywords, and retrieves an up-to-date service manual in HTML. She saves the pertinent pages on her laptop and prints them for hard copy reference at the customer site.
- A product manager receives an email from his favorite electronic bookstore informing him that they have received a new book matching his product interests. (He had inquired about a similar subject several weeks before, and left his email address to be contacted when new books arrived covering similar subjects.) With one click he jumps from the email message to the web page describing the book and clicks on “Order.” The bookstore confirms that he wishes to use the credit card number on record, and ships the book within two days, an improvement of eight-to-ten days over the manual ordering system used six months ago.

The use of the Web in business transactions is called Electronic Commerce. Many businesses are moving their intercompany and customer transactions to the Web as security and standards make it safer to do so. Still more businesses are finding completely new avenues of business made possible by the Web. The emergence of platform independent programming tools has brought information once buried in corporate databases to the fingertips of the masses, and allows businesses to capture useful details from customer transactions that provide future marketing opportunities... the possibilities now seem limitless.

## Keys Points to Remember

- The Web is a subset of the Internet
- The Internet is a network of loosely connected networks communicating primarily over TCP/IP.
- The Internet is growing at an amazing rate, with over 19 million hosts attached by mid-1997.
- A browser is the program used to translate HTML files into information you can view on virtually any video display.